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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/023,170	02/13/1998	THOMAS J. HOLMAN	042390.P5346	6582

7590 08/27/2003

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EXAMINER
VERBRUGGE, KEVIN

ART UNIT	PAPER NUMBER
2188	24

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/023,170	HOLMAN, THOMAS J.	
	Examiner	Art Unit	
	Kevin Verbrugge	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Prosecution Application

The request filed on 6/16/03 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/023170 is acceptable and a CPA has been established. An action on the CPA follows.

Response to Amendment

This non-final Office action is in response to the CPA request above and the accompanying Amendment C, paper #24, filed 6/16/03 and refiled by fax on 7/31/03 at the Examiner's request since the original CPA request and amendment had not then yet been received. This amendment canceled claims 1-20 and added new claims 21-40. Claims 21-40 are therefore pending.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 21-40 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15-31 of copending Application No. 09/023172 and claims 18-30 of copending Application No. 09/023234. Although the conflicting claims are not identical, they are not patentably distinct from each other because the differences in the claims are immaterial.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 23, 30, 39, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,357,621 to Cox.

Regarding claims 21 and 30, Cox discloses a serial architecture for memory module control.

Cox shows the claimed memory bus in Fig. 1 as the bus connecting MCL system controller 11 with the memory modules.

He shows the claimed system memory controller as MCL system controller 11.

He shows the claimed first memory module as module 1, item 20. He shows the claimed first plurality of memory devices as memory blk 1 and memory blk 2. He shows the claimed first memory module controller as MCL controller 13 and memory address control logic 21.

Regarding claim 23, Cox's first memory module controller performs the claimed function of ignoring memory address requests that are not addressed to the memory devices on its memory module. He teaches that "Each memory module responds to a range of addresses that includes its starting address and its ending address" (column 1, lines 59-61).

Regarding claim 39, Cox shows the claimed second memory module as module 2 in Fig. 1. Module 2 includes the claimed second plurality of memory devices as memory blk 1 and memory blk 2. Module 2 also includes the claimed second memory module controller as MCL controller 15 and memory address control logic 21.

Regarding claim 40, Cox teaches that it was known to include different size memory devices on memory modules at column 1, lines 38-50. One embodiment of Cox's device, therefore, would have memory modules with different size memory

devices on them, meeting the claimed limitation of the memory devices having "different characteristics".

The claimed limitation of "different characteristics" is also met by the realization that all memory devices have different characteristics in the sense that no two memory devices are exactly alike. Even memory devices made to the same standards with the same shape, size, and speed requirements will have small, but definite, differences in shape, speed, size, heat generation, defect location, component size, etc. These minute differences between memory devices are enough to anticipate the broad limitation "different characteristics".

****

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21-23 and 30-32 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,790,447 to Laudon et al., hereinafter simply Laudon.

Regarding claims 21 and 30, Laudon discloses a high-memory capacity DIMM with data and state memory.

He does not explicitly show the claimed memory bus and system memory controller, but there are inherent in his system since a system memory controller is required to control all the memory modules and a memory bus is required to transmit the signals from the system memory controller to the memory modules.

He shows the claimed first memory module as DIMM 102 in Fig. 4, for example. He shows the claimed first plurality of memory devices as SDRAM chips D0-D17. He shows the claimed first memory module controller as the control circuitry on the DIMM, including state memory 106, address/control buffers 214 and 216, and clock driver 218.

Regarding claims 22 and 31, Laudon shows the claimed clock generator as clock driver 218 in Fig. 4.

Regarding claims 23 and 32, Laudon's memory module control circuitry includes the claimed request handling logic to determine if an address on the bus is directed at that particular memory module.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,790,447 to Laudon et al., hereinafter simply Laudon.

Regarding claim 39, Laudon only shows a single DIMM, but it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a second DIMM in a system in increase the amount of memory available to the processor.

Regarding claim 40, Laudon does not teach a second memory module, but it would have been obvious to one of ordinary skill in the art at the time the invention was made to include one as discussed in the grounds of rejection of claim 39. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a memory module with memory devices having different characteristics than the memory devices on the first memory module since doing so would allow for more system flexibility. The second plurality of memory devices could be of a different size, speed, etc. This would have been obvious since memory characteristics are frequently changing as manufacturers continually improve product offerings.

The claimed limitation of "different characteristics" is also met by the realization that all memory devices have different characteristics in the sense that no two memory devices are exactly alike. Even memory devices made to the same standards with the

same shape, size, and speed requirements will have small, but definite, differences in shape, speed, size, heat generation, defect location, component size, etc. These minute differences between memory devices are enough to anticipate the broad limitation "different characteristics".

****

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,357,621 to Cox.

Regarding claims 22 and 31, Cox does not disclose a clock generator on his memory modules. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the claimed clock generator to enhance control of the memory module and enable clocking the devices at a different rate than the memory bus.

Regarding claim 32, Cox's first memory module controller performs the claimed function of ignoring memory address requests that are not addressed to the memory

devices on its memory module. He teaches that "Each memory module responds to a range of addresses that includes its starting address and its ending address" (column 1, lines 59-61).

****

Claims 24-29 and 33-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,357,621 to Cox in view of 5,655,113 to Leung et al. and 5,036,493 to Nielsen.

Cox does not teach that his memory module controllers include the claimed power management unit to control power supplied to the memory devices.

However, Leung (column 4, lines 33-37) and Nielsen both disclose systems which reduce power consumption by reducing power to part or all of one or more memory modules.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include power management circuitry on the memory modules of Cox to control the power consumed by the modules. The particular method of reducing the power consumed by the modules is a matter design choice and would include all of the claimed options: reduce power to the individual memory devices, decouple the devices from the bus, alter the clock frequency, and disable the clock.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-29 and 33-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,790,447 to Laudon et al. in view of 5,655,113 to Leung et al. and 5,036,493 to Nielsen.

Laudon does not teach that his memory module controllers include the claimed power management unit to control power supplied to the memory devices.

However, Leung (column 4, lines 33-37) and Nielsen both disclose systems which reduce power consumption by reducing power to part or all of one or more memory modules.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include power management circuitry on the memory modules of Laudon to control the power consumed by the modules. The particular method of reducing the power consumed by the modules is a matter design choice and would include all of the claimed options: operate the devices at a different voltage than the memory bus, reduce power to the individual memory devices, decouple the devices from the bus, alter the clock frequency, and disable the clock.

Conclusion

The method claims are grouped and rejected with the apparatus claims because the steps of the method are met by the disclosure of the apparatus and methods of the reference(s) as discussed above.

Any inquiry concerning this or an earlier communication from the Examiner should be directed to Primary Examiner Kevin Verbrugge by phone at (703) 308-6663.

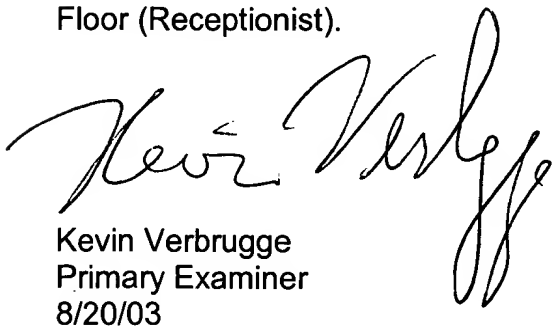
Any response to this action should be mailed to Commissioner for Patents, Washington, D.C. 20231 or faxed to

(703) 746-7238 After-final

(703) 746-7239 Official

(703) 746-7240 Non-Official/Draft

and labeled appropriately (After-final, Official, Non-Official/Draft). Hand-delivered responses should be brought to Crystal Park 2, 2121 Crystal Drive, Arlington, VA, 4th Floor (Receptionist).



Kevin Verbrugge
Primary Examiner
8/20/03

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IMPORTANT NOTICE

The Examiner's art unit number has changed from 2187 to 2188 due to the recent realignment of workgroup 2180. Please use art unit **2188** on all correspondence related to this case.

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